Assessment: The silent killer of learning

Enhancing Teaching Effectiveness
Nyack College
Nyack, NY, 21 October 2016
Assessment: The silent killer of learning

Enhancing Teaching Effectiveness
Nyack College
Nyack, NY, 21 October 2016
kosten
1. die Kosten (pl.)
2. kostbar

krank
1. die Krankheit, -en

cow

das Kind, -(e)s, -(e)n
1. kindisch
2. kindlich

magnificent
globulous
lendid
1. magnificent
2. masterful

kennen
1. kennen-gekannt
2. kennen-lernen
3. kennen
4. kennenlernen

think of

428
430
455
kosten

pedantic
adj. ostentatious in one's learning
35% retained after 1 week
we only guarantee they’ll pass the test
assessment focussed on ranking and classifying, not on developing 21st century skills
purposes
purposes

problems
how many different purposes of assessment can you think of?
1. rate students
2. rate professor and course
3. motivate students to keep up with work
4. provide feedback on learning to students
5. provide feedback to instructor
6. provide instructional accountability
7. improve teaching and learning
purposes

problems
inauthentic tests
what is the meaning/definition of...?
inauthentic problem solving

1 purposes
2 problems
problem
1 purposes
2 problems
1 purposes
2 problems

Problem

Outcome

KNOWN
1 purposes
2 problems

problem → solution → outcome

KNOWN
1. purposes
2. problems
1 purposes
2 problems
1. purposes
2. problems
1 purposes
2 problems
1 purposes

2 problems
On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.
On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?
On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

Requires:
Assumptions
Developing a model
Applying that model
On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

Requires:
Assumptions
Developing a model
Applying that model
On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. **On average people shop for 2 hours.**

How long do you have to wait before someone frees up a space?

**Requires:**

Assumptions
Developing a model
Applying that model
On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions
Developing a model
Applying that model
On a Saturday afternoon, you pull into a parking lot with un-metered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions
Developing a model
Applying that model
On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?
On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

\[ t_{\text{wait}} = \frac{T_{\text{shop}}}{N_{\text{spaces}}} \]
On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

\[ t_{\text{wait}} = \frac{T_{\text{shop}}}{N_{\text{spaces}}} \]
1 purposes 2 problems
REAL problem solving
grading incompatible with real problem solving
1 purposes
2 problems
isolation

1 purposes
2 problems
We will use spherical coordinates: $0 \leq \theta \leq \pi$, $0 \leq \phi \leq \frac{\pi}{2}$, $0 \leq r < \infty$. The integral is thus:

$$\int_0^\infty \int_0^{\pi/2} \int_0^{2\pi} \rho^2 \sin \phi \, d\phi \, d\theta \, dr$$

$$= \left\{ \int_0^\infty \rho^2 \, dr \right\} \left\{ \int_0^{\pi/2} \sin \phi \, d\phi \right\} \left\{ \int_0^{2\pi} \, d\theta \right\}$$

$$= \left\{ \frac{\rho^3}{3} \right\} \left\{ -\cos \phi \right\} \left\{ 2\pi \right\}$$

$$= \frac{2\pi \rho^3}{3} \left\{ 1 - 0 \right\} = \frac{2\pi \rho^3}{3}$$

$$= \boxed{0}$$
high-stakes examinations promote cramming

1 purposes  2 problems
information stored in short-term memory
information stored in short-term memory

no retention

no transfer

1 purposes

2 problems
assessment produces a conflict

purposes

problems
assessment produces a conflict
coach or judge?

1 purposes
2 problems
conflict resolved by:

objectivity (fairness, reliability)

1 purposes
2 problems
List the three important concepts that the Law of conservation of Energy leads to:

- Equilibrium
- Thermodynamics
- Kinetics

Determine the Law of definite composition (Dalton's Law):

- Elements always contain exactly the same elements by mass.
only lowest order thinking skills can be judged objectively
and then there is…

- grade inflation
- cheating

1. purposes
2. problems
1 purposes
2 problems
3 improvements
1 mimic real life
open-book exam

1 purposes
2 problems
3 improvements
1 purposes
2 problems
3 improvements
1 purposes
2 problems
3 improvements

1 REMEMBERING
2 UNDERSTANDING
3 APPLYING
4 ANALYZING
5 EVALUATING
6 CREATING
1. purposes
2. problems
3. improvements
1 purposes  
2 problems  
3 improvements
1. purposes
2. problems
3. improvements
Session 389314

This is the individual round; work on these questions on your own.

expression question

What is the derivative of $f(x) = 3x^2 - 6x$?

Enter an expression, e.g., $x^2$ for $x^2$, $\ln(y) - \sin(x)$ for $\ln y - \sin x$, $x/(y+1)$ for $\frac{x}{y+1}$, $(1/2)x$ for $\frac{1}{2}x$. Do not enter a complete equation.

Current team: Blue team  🧐 Change team  ✉️ Change seat  ☑️ Send a message to the instructor  ⤵️ Join another
This is the individual round;

**expression question**

What is the derivative of $f(x) = 3x^2 - 6x$?

Enter an expression, e.g., $x^2$ for $x^2$, $\ln(y) - \sin(x)$ for $\ln y - \sin x$. 

1 purposes
2 problems
3 improvements
This is the individual round;

expression question

What is the derivative of \( f(x) = 3x^2 - 6x \)?

\[ 6x - 6 \]

Submit response

Enter an expression, e.g., \( x^2 \) for \( x^2 \), \( \ln(y) - \sin(x) \) for \( \ln y - \sin x \).
What is the derivative of $f(x) = 3x^2 - 6x$?

Enter an expression, e.g., $x^2$ for $x^2$, $\ln(y) - \sin(x)$ for $\ln y - \sin(x)$.
2 focus on feedback, not ranking
objective ranking: a myth
2 metrics, 2 results

![Graph showing the relationship between conceptual understanding and final grade. The x-axis represents conceptual understanding ranging from 0 to 30, while the y-axis represents final grade ranging from 0 to 100. The data points are scattered across the graph, indicating a positive correlation between the two metrics.](image-url)
Aristotelian thinkers

1. Purposes
2. Problems
3. Improvements
top performers, broad grade distribution

![Graph showing the relationship between conceptual understanding and final grade]

1. purposes
2. problems
3. improvements
objectivity or injustice?

1. purposes
2. problems
3. improvements
focus on skills, not content
Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

1. purposes
2. problems
3. improvements
Traditional approach to course planning

1. purposes
2. problems
3. improvements

course content
Traditional approach to course planning

1. purposes
2. problems
3. improvements

- course content
- assessment
Traditional approach to course planning

1. purposes
2. problems
3. improvements

course determined by content

- course content
- assessment
Backward design

1. purposes
2. problems
3. improvements

desired outcomes
Backward design

1. purposes
2. problems
3. improvements

acceptable evidence → desired outcomes
Backward design

1. purposes
2. problems
3. improvements

instructional approach
acceptable evidence
desired outcomes
Backward design

1 purposes
2 problems
3 improvements
Backward design

course defined by outcomes

1 purposes
2 problems
3 improvements
resolve coach/judge conflict
use external evaluators

1. purposes
2. problems
3. improvements
peer- and self-assessment

1. purposes
2. problems
3. improvements
Calibrated Peer Review

cpr.molsci.ucla.edu

1 purposes

2 problems

3 improvements

Describe the Law of definite composition (Dalton’s Law).

Equilibrium (boring)

Kinetics (wow, wow, wow)

TA: Always boring

Chemical proportion: I saw my TA, Jimmy, always boring.

Unrelated reaction: I saw my TA, Jimmy, always boring.

Increase or decrease of the substance:

Energy involved:

Sometimes hot or light...
rethink assessment
For a copy of these slides:

ericmazur.com

Follow me! eric_mazur